

Amended specification for Application 10/566,482

Paragraph 0023:

The wavelength of light emitted by the thin film light sources and the wavelength of light preferentially received by the thin film photodetectors can be controlled by arranging the light sources and the photodetectors in the form of micro-cavity devices where the dimension of the resonant cavity in which the semiconductor material is enclosed, is in the order of half wavelength of light to be emitted or detected, respectively [H. Yokoyama “ Physics and device applications of optical microcavities” Science, Vol. 256, April 1992, pp. 66-70]. Placing the semiconductor layer between two mirrors can form a vertical micro-cavity. The two electrodes of light source/photodetector can be used as the mirrors. Alternatively, a micro-cavity can be produced by forming a photonic band gap micro-cavity [P. Bhattacharya “Cavities of crystal light” IEEE Circuit and Devices Magazine, March 2003, pp.25-33] through an appropriate periodic structure incorporated in the semiconductor layer. The resonant wavelength of such photonic band gap micro-cavity can be adjusted by adjusting the photonic band gap design. The advantage of this photonic band gap micro-cavity embodiment is that more than one wavelength for the light sources and more than one wavelength for the photodetectors that can be defined in a single lithographic step. For the case of a vertical micro-cavity such multi-wavelength definition will require a number of etching steps to locally adjust the cavity dimension i.e. the thickness of the semiconductor p-n bi-layer.